

(i) the amended claims are without markings to indicate the changes made, and

(ii) in each claim, a parenthetical expression follows the claim number indicating the status of the claim as amended, unchanged or new.

- 5 (2) Attached hereto is a separate paper entitled
"Version of Amended Claims with Markings to show Changes requested by the accompanying Reply".

That separate paper sets out each of the rewritten claims (but not the unchanged and new claims), marked up to show all the changes relative to the previous version
10 of the claim. In that separate paper, the changes are shown by square brackets (for deleted matter) and underlining (for added matter).

1. (Amended) A gas-permeable membrane which is useful in the packaging of respiring biological materials and which comprises

15 (a) a microporous polymeric film comprising a network of interconnected pores such that gases can pass through the film, and

(b) a polymeric coating on the microporous film,

wherein

20 (1) the pores in the microporous film have an average pore size of less than 0.24 micron; and

(2) the microporous film was prepared by a process comprising the steps of

(A) preparing a uniform mixture comprising a polymeric matrix material in the form of a powder, a finely divided, particulate, substantially water-insoluble filler, and a processing oil;

25 (B) extruding the mixture as a continuous sheet;

(C) forwarding the continuous sheet, without drawing, to a pair of heated calender rolls;

(D) passing the continuous sheet through the calender rolls to form a sheet of lesser thickness;

30 (E) passing the sheet from step (D) to a first extraction zone in which the processing oil is substantially removed by extraction with an organic

extraction liquid which is a good solvent for the processing oil, a poor solvent for the polymeric matrix material, and more volatile than the processing oil;

(F) passing the sheet from step (E) to a second extraction zone in which the organic extraction liquid is substantially removed by steam or water or both; and

(G) passing the sheet from step (F) through a forced air dryer to remove residual water and organic extraction liquid; and

(3) the polymeric coating has a thickness such that the membrane

(i) has a P_{10} ratio, over at least one 10 °C range between -5 and 15°C, of at least 1.3;

(ii) has an oxygen permeability (OTR), at all temperatures between 20 and 25 °C, of at least 775,000 ml/m².atm.24 hrs (50,000 cc/100 inch².atm.24 hrs; and

(iii) has a CO₂/O₂ permeability ratio(R) of at least 1.5;

the P_{10} , OTR and R values being measured at a pressure of 0.035 kg/cm² (0.5 psi);

subject to the proviso that the polymeric coating does not comprise a crystalline polymer having a peak melting temperature T_p of -5 to 40 °C, an onset of melting temperature T_o such that ($T_p - T_o$) is less than 10 °C, and a heat of fusion of at least 5 J/g.

2. (Amended) A membrane according to claim 1 wherein the polymeric matrix material is selected from the group consisting of

(i) an essentially linear ultrahigh molecular weight polyethylene having an intrinsic viscosity of at least 18 deciliters/g and

(ii) an essentially linear ultrahigh molecular weight polypropylene having an intrinsic viscosity of at least 6 deciliters/g.

3. (Unchanged) A membrane according to claim 1 wherein at least 70% of the pores in the microporous film have a pore size of less than 0.24 micron.

4. (Unchanged) A membrane according to claim 1 wherein at least 90% of the pores in the microporous film have a pore size of less than 0.24 micron.

5. (Unchanged) A membrane according to claim 1 wherein substantially 100% of the pores in the microporous film have a pore size of less than 0.24 micron.

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6. (Amended) A membrane according to claim 1 wherein at least 80% of the pores in the microporous film have a pore size less than 0.15 micron.

10 7. (Unchanged) A membrane according to Claim 1 which has an OTR of at least 1,550,000 ml/m².atm.24 hrs (100,000 cc/inch².atm.24 hrs), and an R ratio of at least 2, the OTR and R values being measured at a pressure of 0.7 kg/cm² (10 psi).

15 8. (Unchanged) A membrane according to claim 7 which has an OTR of at least 2,325,000 ml/m².atm.24 hrs (150,000 cc/100 inch².atm.24 hrs) measured at a pressure of 0.7 kg/cm² (10 psi).

Claims 9 and 10 previously canceled by the Preliminary Amendment.

20 11. (Unchanged) A membrane according to claim 1 wherein the coating polymer is polydimethyl siloxane.

12. (Unchanged) A membrane according to claim 1 wherein the coating polymer is cis-polybutadiene, poly(4-methylpentene) or ethylene-propylene rubber.

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13. (Unchanged) A membrane according to claim 1 wherein the coating polymer has been crosslinked.

30 14. (Unchanged) A membrane according to claim 1 wherein the coating polymer has at least one of the following characteristics:

(1) it is an acrylate polymer containing at least 40% by weight of units derived

from a cycloalkyl acrylate or methacrylate;

(2) it is a fluoropolymer;

(2) it is an acrylate polymer containing units derived from a fluoroalkyl acrylate or methacrylate;

5 (3) it is an acrylate polymer containing 10 to 70% of units derived from a polyethylene glycol acrylate or methacrylate.

15. (Unchanged) A membrane according to claim 1 wherein the microporous polymeric film contains pores which are partially blocked by a polymer having an R ratio
10 of less than 1.3 or by a particulate material, or (b) has an OTR before coating of less than 15,500,000 (1,000,000).

16. (Unchanged) A package which is stored in air and which comprises
(a) a sealed container, and
15 (b) within the sealed container, a respiring biological material and a packaging atmosphere around the biological material;
the sealed container including one or more permeable control sections which provide at least the principal pathway for oxygen and carbon dioxide to enter or leave the packaging atmosphere, at least one said permeable control section being a gas-
20 permeable membrane as defined in claim 1.

Claims 17-19 previously canceled by the Preliminary Amendment

20. (Amended) A gas-permeable membrane which is useful in the packaging of
25 respiring biological materials and which comprises

(a) a microporous polymeric film comprising a network of interconnected pores such that gases can pass through the film, and

(b) a polymeric coating on the microporous film,

wherein

30 (1) the pores in the microporous film have an average pore size of less than 0.24 micron;

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- (2) at least 70% of the pores in the microporous film have a pore size of less than 0.24 micron;
 - (3) less than 20% of the pores in the microporous film have a pore size less than 0.014 micron;
 - (4) at least 80% of the pores in the microporous film have a pore size less than 0.15 micron; and
 - (5) the polymeric coating has a thickness such that the membrane
 - (i) has a P_{10} ratio, over at least one 10°C range between -5 and 15 °C, of at least 1.3;
 - (ii) has an oxygen permeability (OTR), at all temperatures between 20° and 25°C, of at least 775,000 ml/m².atm.24 hrs (50,000 cc/100 inch².atm.24 hrs; and
 - (iii) has a CO₂/O₂ permeability ratio(R) of at least 1.5;the P_{10} , OTR and R values being measured at a pressure of 0.035 kg/cm² (0.5 psi);

subject to the proviso that the polymeric coating does not comprise a crystalline polymer having a peak melting temperature T_p of -5 to 40 °C, an onset of melting temperature T_o such that $(T_p - T_o)$ is less than 10 °C, and a heat of fusion of at least 5 J/g.

20 21. (Unchanged) A membrane according to claim 20 wherein at least 90% of the pores in the microporous film have a pore size less than 0.24 micron.

22. (Unchanged) A membrane according to claim 20 wherein substantially 100% of the pores in the microporous film have a pore size less than 0.24 micron.

25 23. (Unchanged) A membrane according to claim 20 wherein at least 80% of the pores in the microporous film have a pore size less than 0.15 micron and at least 70% of the pores in the microporous film have a pore size less than 0.11 micron.

30 24. (Unchanged) A membrane according to claim 20 which has an OTR at all temperatures between 20°C and 25°C of at least 1,550,000 ml/m².atm.24 hrs (100,000

cc/inch².atm.24 hrs) and an R ratio of at least 2.5, the OTR and R values being measured at a pressure of 0.035 kg/cm² (0.5 psi).

25. (Unchanged) A membrane according to claim 20 which has an OTR of at least
5 2,325,000 ml/m².atm.24 hrs (150,000 cc/100 inch².atm.24 hrs) measured at a pressure of 0.07 kg/cm² (10 psi).

26. (Unchanged) A membrane according to claim 20 wherein the coating polymer is polydimethyl siloxane.

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27. (Unchanged) A membrane according to claim 20 wherein the coating polymer is cis-polybutadiene, poly(4-methylpentene) or ethylene-propylene rubber.

28. (Unchanged) A membrane according to claim 20 wherein the coating polymer
15 has been crosslinked.

29. (Unchanged) A package which is stored in air and which comprises

(a) a sealed container, and

(b) within the sealed container, a respiring biological material and a packaging
20 atmosphere around the biological material;

the sealed container including one or more permeable control sections which provide at least the principal pathway for oxygen and carbon dioxide to enter or leave the packaging atmosphere, at least one said permeable control section being a gas-permeable membrane as defined in claim 20.

30. (New) A membrane according to claim 1 wherein the filler is a siliceous filler.

31. (New) A membrane according to claim 20 wherein the microporous polymeric film comprises a polymeric matrix having a siliceous filler dispersed therein.